G 1112 (Pages : 2) Reg. No.....

Name.....

B.TECH DEGREE EXAMINATION, MAY 2015

Seventh Semester

Branch : Electronics and Communication Engineering

EC 010 706 L03—DIGITAL IMAGE PROCESSING (Elective II) [EC]

(New Scheme—2010 Admission onwards)

[Improvement/Supplementary]

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 3 *marks.*

1. Distinguish between a raster and a vector image.
2. List the properties of 2D-Discrete Fourier Transformation.
3. Write similarity and difference between Harmard and Walsh Transformation.
4. Write the advantage and disadvantage of Block processing.
5. The Prewitt edge detector is a much better operator than the Roberts operator why ? (Give the matrix.)

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Write and explain image classification.
7. Compute the 2D-Descret Fourier Transformation of the 4 × 4 gray scale image as given below :

$$f(x, y) = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}.$$

8. Considering the following image segment Based on histogram segment the image into 2 regions.

$$\begin{bmatrix} 128 & 128 & 128 & 64 \\ 64 & 64 & 8 & 128 \\ 64 & 64 & 32 & 32 \\ 64 & 8 & 8 & 8 \end{bmatrix}.$$

Turn over

9. Giving the broad classification of Image enhancements explain the techniques used in enhancement.

10. Explain lossless and lossy compression with examples.

(5 × 5 = 25 marks)

Part C

Answer **all** *questions.*
Each question carries 12 *marks.*

11. Explain different Image file format (any 3).

Or

12. Explain Concepts of Quantization and Resolution of an Image.

13. Prove that the inverse 2D Fourier Transformation of the 2D Fourier Transformation of $f(m,n)$ is $f(-m,-n)$.

Or

14. Explain 2D- Discrete Fourier Transform.

15. Derive equations for Spatial domain High-pass filtering *or* image sharpening.

Or

16. Under non-linear gray level slicing explain logarithmic, exponential and power law transformation.

17. Explain Global Thresholding, Adaptive thresholds and Histogram-based thresholding selection in image segmentation.

Or

18. Explain region Splitting and merging in image segmentation.

19. Explain different modes of JPEG standard.

Or

20. Explain the basics of Fractal under wavelet Based Image compression.

(5 × 12 = 60 marks)